

**guided notes**

NAME \_\_\_\_\_

**Module 16** Solving Rational Equations  
**Lesson 2** Solving Problems Using Direct Variation

**Lesson Objectives**

- Determine whether a function is a direct variation and identify the constant of variation.
- Solve problems using direct variation.

A direct variation involving  $x$  and  $y$  is a function in which the ratio  $\frac{y}{x}$  is a nonzero **constant**.

For a direct variation involving  $x$  and  $y$ ,  $y$  **varies directly** as  $x$ .

In the direct variation  $\frac{y}{x} = k$ ,  $k$  is the **constant of variation**.

1 Does  $y$  vary directly as  $x$ ?

$x$	$y$
8	6
12	9
15	10

**No,  $y$  does not vary directly as  $x$ .**

2 Is this function a direct variation?

$x$	$y$
3	15
5	25
-2	-10

**Yes, this function is a direct variation.**

3 Write an equation for the direct variation.

$x$	$y$
3	15
5	25
-2	-10

**$\frac{y}{x} = 5$**

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- 4 The distance between cities on a map varies directly with the actual distance between the cities. The distance between two cities on a particular map is five inches. The actual distance between the cities is 65 miles. What is the actual distance between two cities that are three inches apart on the map?

**39 miles**

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- 5 The time it takes you to hear thunder varies directly with your distance from the lightning. If you are two miles from a lightning strike, you will hear the thunder clap about ten seconds after you see the lightning. How far are you from a lightning strike if you hear the thunder clap four seconds after you see the lightning?

**0.8 mile**

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